

1 During final design a combined-use disposal facility could be configured in numerous ways. Differ-
2 ent waste types could be disposed of in separate cells within a combined-use disposal facility, or different
3 waste types could be disposed of in the same cell (commingled). Little interaction between the different
4 waste types is anticipated because MLLW, ILAW, and the melters would be treated to meet applicable
5 regulatory requirements. In addition, all waste types would need to meet the waste acceptance criteria for
6 that disposal facility. The separate cells could be permitted under RCRA where appropriate, or the entire
7 facility could be operated under a single regulatory program.
8

9 **3.1.7 Summary Tables of Alternative Groups**

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11 To facilitate comparison and references for each of the alternative groups, Tables 3.1 and 3.2 summa-
12 rize the various actions proposed as part of each group. Table 3.1 provides the treatment alternatives and
13 Table 3.2 provides the disposal alternatives. Table 3.1 identifies the various treatment alternatives on a
14 waste stream level and shows which individual alternatives (indicated by bullet) are included in each
15 alternative group. The ILAW and melter waste types are not included in Table 3.1 since the treatment of
16 ILAW and melters is part of the WTP scope. In Table 3.2 the individual disposal facility alternatives are
17 shown for each alternative group.
18

19 **3.2 Alternatives Considered but Not Evaluated in Detail**

20
21 This section describes alternatives that were considered as possible methods for the management of
22 one or more of the waste types, but were not evaluated in detail, because DOE has determined that they
23 are not currently reasonable alternatives. The alternatives are organized by the key activity of storage,
24 treatment, and disposal. This section also provides a qualitative discussion of the Stop Work scenario.
25

26 **3.2.1 Storage Options**

27 28 **3.2.1.1 Storage of Waste at the Generators' Sites**

29
30 Storage of waste at either the Hanford or offsite generators' sites could potentially reduce the storage
31 requirements at CWC. However, the action alternatives do not require additional storage beyond the
32 current CWC capacity. Storage at multiple sites would not allow DOE to take advantage of the econo-
33 mies of scale possible by consolidation of the wastes at CWC and would make security more difficult.
34 Continued storage at generator's sites could be inconsistent with LDR requirements and site treatment
35 plans. Most onsite and offsite generators do not have permitted available onsite storage and would need
36 to increase storage capacity and might adversely impact cleanup and closure activities.
37

38 **3.2.1.2 Shipment of Hanford GTC3 Wastes to Other Sites for Longer-Term Storage**

39
40 No GTC3 LLW is forecast to be generated at Hanford, but 1 m³ is assumed for analysis to address
41 future contingencies. The amount of storage required for this waste is so small in comparison with other
42 wastes, that storage of this waste at Hanford is not expected to impact the required capacity at CWC in
43 any of the alternatives. Shipment of GTC3 wastes from Hanford to other DOE sites would not be

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Table 3.1. Treatment Alternatives Summary

| Treatment Alternatives | Alternative Groups for Analysis | | | | | |
|---|---------------------------------|---|---|---|---|-----------|
| | A | B | C | D | E | No Action |
| LLW – Cat 1 | | | | | | |
| None required; optional by generator | - | - | - | - | - | - |
| LLW – Cat 3, GTC3 | | | | | | |
| HICs or Trench Grouted | s | s | s | s | s | s |
| LLW – Non-Conforming | | | | | | |
| Offsite Facility, establish new contract(s) | • | | • | • | • | |
| New Waste Processing Facility in 200 W Area | | • | | | | |
| None (storage of untreated LLW) | | | | | | • |
| MLLW – RH & Non-Standard Containers | | | | | | |
| Modified T Plant | • | | • | • | • | |
| New Waste Processing Facility in 200 W Area | | • | | | | |
| None (storage of untreated MLLW) | | | | | | • |
| MLLW – CH Standard, Organic Solids & Debris | | | | | | |
| Offsite Facility, complete existing commercial contract | s | s | s | s | s | s |
| Offsite Facility, establish new contract(s) | • | | • | • | • | |
| New Waste Processing Facility in 200 W Area | | • | | | | |
| None (storage of untreated MLLW) | | | | | | • |
| MLLW – CH Standard, Elemental Lead, Elemental Mercury | | | | | | |
| Offsite Facility | • | | • | • | • | |
| New Waste Processing Facility in 200 W Area | | • | | | | |
| None (storage of untreated MLLW) | | | | | | • |
| MLLW – Disposal Trench Leachate | | | | | | |
| Effluent Treatment Facility (ETF) | s | s | s | s | s | s |
| Pulse dryers after ETF closure | s | s | s | s | s | s |
| TRUW – CH Standard (retrievably stored in LLBGs & CWC, newly generated) | | | | | | |
| WRAP | • | • | • | • | • | • |
| Mobile Units in 200 W Area | | • | | | | |
| TRUW – CH Non-Standard (LLBGs, CWC, newly generated), RH (LLBGs, caissons, CWC, newly generated), K Basin sludge, PCB Commingled | | | | | | |
| Modified T Plant | • | | • | • | • | |
| New Waste Processing Facility in 200 W Area | | • | | | | |
| Mobile Units in 200 W Area | | • | | | | |
| None (storage of unprocessed TRU Waste) | | | | | | • |
| - = Activity not included in analysis s = Activity included in analysis; same for all alternatives • = Alternative actions evaluated in analysis group. | | | | | | |

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Table 3.2. Disposal Alternatives Summary

| Disposal Alternatives for New Construction ^(a) | Alternative Groups for Analysis | | | | | | | | | No Action |
|--|---------------------------------|---|---|---|---|---|---|---|---|-----------|
| | A | B | C | D | | | E | | | |
| | | | | 1 | 2 | 3 | 1 | 2 | 3 | |
| LLW – Cat 1, Cat 3, GTC3, Non-Conforming | | | | | | | | | | |
| 200 W LLBG – Existing design unlined trenches | | • | | | | | | | | |
| 200 W LLBG – Deeper, wider unlined trenches | • | | | | | | | | | |
| 200 W LLBG – Single unlined trench | | | • | | | | | | | |
| Near PUREX – Modular combined-use lined facility | | | | • | | | | • | | |
| 200 E LLBG – Modular combined-use lined facility | | | | | • | | • | | | |
| ERDF – Modular combined use lined facility | | | | | | • | | | • | |
| 200 W LLBG – Existing design unlined trenches, backfill only, no barrier (Cat 1, Cat 3, GTC3 LLW) | | | | | | | | | | • |
| None (storage of non-conforming LLW) | | | | | | | | | | • |
| Previously Buried Waste | | | | | | | | | | |
| Install modified RCRA Subtitle C barrier | • | • | • | • | • | • | • | • | • | |
| Backfill only, no RCRA barrier | | | | | | | | | | • |
| MLLW – treated, ready for disposal, RH & CH MLLW, Elemental Lead & Elemental Mercury, solids from MLLW leachate treatment | | | | | | | | | | |
| 200 E LLBG – Existing design lined trenches | | • | | | | | | | | |
| 200 E LLBG – Deeper, wider lined trenches | • | | | | | | | | | |
| 200 E LLBG – Single expandable lined trench | | | • | | | | | | | |
| Near PUREX – Modular combined-use lined facility | | | | • | | | | • | | |
| 200 E LLBG – Modular combined-use lined facility | | | | | • | | • | | | |
| ERDF – Modular combined-use lined facility | | | | | | • | | | • | |
| None (storage of untreated MLLW and treated MLLW in excess of existing disposal capacity) | | | | | | | | | | • |
| TRUW – CH Standard | | | | | | | | | | |
| Ship to Waste Isolation Pilot Plant | S | S | S | S | S | S | S | S | S | S |
| TRUW – CH Non-Standard, RH, K Basin sludge, PCB | | | | | | | | | | |
| Ship to Waste Isolation Pilot Plant | • | • | • | • | • | • | • | • | • | |
| None (storage of unprocessed TRUW) | | | | | | | | | | • |
| <p>(a) In all cases, existing trench space for LLW and MLLW in the 200 W Area, LLBGs would be filled before constructing new disposal capacity. All disposal facilities would be covered with a modified RCRA Subtitle C barrier as filled or at closure, except as noted.</p> <p>S = Activity included in analysis; same in all alternative groups.</p> <p>• = Alternative actions evaluated in analysis group.</p> | | | | | | | | | | |

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Table 3.2. (contd)

| Disposal Alternatives for New Construction ^(a) | Alternative Groups for Analysis | | | | | | | | | No Action |
|--|---------------------------------|---|---|---|---|---|---|---|---|-----------|
| | A | B | C | D | | | E | | | |
| | | | | 1 | 2 | 3 | 1 | 2 | 3 | |
| WTP Melters | | | | | | | | | | |
| Near PUREX – Single lined trench | • | | • | | | | | | | |
| 200 E LLBG – Single lined trench | | • | | | | | | | | |
| Near PUREX – Modular combined-use lined facility | | | | • | | | | | • | |
| 200 E LLBG – Modular combined-use lined facility | | | | | • | | | | | |
| ERDF – Modular combined-use lined facility | | | | | | • | • | • | | |
| None (storage) | | | | | | | | | | • |
| ILAW | | | | | | | | | | |
| Near PUREX – Multiple lined trenches | • | | | | | | | | | |
| 200 W Area – Multiple lined trenches | | • | | | | | | | | |
| Near PUREX – Single lined trench | | | • | | | | | | | |
| Near PUREX – Modular combined-use lined facility | | | | • | | | | | • | |
| 200 E LLBG – Modular combined-use lined facility | | | | | • | | | | | |
| ERDF – Modular combined-use lined facility | | | | | | • | • | • | | |
| Near PUREX – Lined vault disposal facility | | | | | | | | | | • |
| <p>(a) In all cases, existing trench space for LLW and MLLW in the 200 W Area, LLBGs would be filled before constructing new disposal capacity. All disposal facilities would be covered with a modified RCRA Subtitle C barrier as filled or at closure, except as noted.</p> <p>• = Alternative actions evaluated in analysis group.</p> | | | | | | | | | | |

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consistent with the WM PEIS ROD (65 FR 10061) for LLW and MLLW. The effort required to send waste to another site would be greater than the effort to store onsite. Thus, the most reasonable storage alternative for GTC3 LLW is storage in CWC.

3.2.2 Treatment Options

3.2.2.1 Use of Offsite DOE Facilities for Treatment of All Hanford Waste

The consolidation of waste management functions at designated DOE sites was a major focus of the WM PEIS (DOE 1997b). Attempts were made to identify treatment capacity at other DOE sites for Hanford wastes, but treatment capacity is limited at other DOE sites. Therefore, this is not a reasonable alternative for all Hanford waste. If DOE were able to ship wastes to other DOE sites for treatment, potential impacts would be similar to those for commercial treatment. Hanford may ship small-volume waste streams to other DOE sites in the future if specialized facilities become available. However, impacts of those shipments would be similar to those included for offsite treatment of MLLW.

1 **3.2.2.2 Use of the Effluent Treatment Facility for Non-Conforming LLW**
2

3 Much of the non-conforming LLW stream is organic-based liquid. The treatment of these liquids in
4 the ETF was considered. However, organic-based liquids wastes are not compatible with the aqueous-
5 based ETF treatment system.
6

7 **3.2.3 Disposal Options**
8

9 **3.2.3.1 Use of Canyon Facilities for Disposal of Specific Wastes**
10

11 An ongoing CERCLA study is considering the use of the major canyon facilities for disposal of some
12 waste types that are included in the HSW EIS (Hanford Advisory Board 1997; Richland Environmental
13 Restoration Project 2001). As currently envisioned, higher-hazard waste such as Cat 3 LLW would be
14 placed inside the canyons and lower-activity wastes (Cat 1 LLW, for example) would be placed above
15 and outside the canyon. Waste in the cells might be grouted in place, which would provide additional
16 protection from intrusion as well as mitigating contaminant transport. The entire facility would then be
17 capped with an engineered barrier. Performance monitoring of the barrier would be conducted and
18 adjustments made as necessary. The canyons, with their thick cement walls, would provide containment
19 of the wastes inside and retard their dispersal over the long term. The wastes outside the canyons should
20 be as well contained as wastes placed in the LLBGs. This concept is not sufficiently well developed for
21 detailed analysis at this time. It is being studied as part of the CERCLA process, and if pursued, would be
22 subject to future environmental review before implementation.
23

24 **3.2.3.2 Leave Retrievably Stored Transuranic Waste in the Low Level Burial Grounds**
25

26 In this alternative, retrievably stored TRU waste in trenches and caissons would remain buried and
27 would not be retrieved. Further actions could be taken to minimize environmental impacts, including the
28 placement of a barrier over the waste to reduce the potential for further waste migration. This alternative
29 would be attractive from an operational standpoint because it would reduce worker exposure to radio-
30 active materials from retrieval, treatment, and transportation activities, particularly the high radiation
31 doses from RH TRU wastes in the caissons. Modeling of this alternative indicates that it would not result
32 in substantial radionuclide discharges to the accessible environment, or have other major environmental
33 impacts; however, it would not be consistent with previous NEPA decisions to retrieve the waste or with
34 the national policy to ship TRU waste to WIPP.
35

36 **3.2.3.3 Use of U.S. Ecology Disposal Facility**
37

38 The U.S. Ecology commercial LLW disposal site is located on land leased to the State of Washington
39 near the 200 Areas within the Hanford Site boundary and could receive some of the LLW expected to be
40 buried in Hanford Solid Waste disposal facilities. A draft State of Washington Environmental Policy Act
41 (SEPA) EIS for the U.S. Ecology facility has been issued (WDOH and Ecology 2000). However, this
42 alternative was not considered reasonable as a replacement for DOE disposal capabilities because some
43 wastes managed by DOE could not be accepted by commercial facilities, and the Hanford infrastructure
44 would still be necessary to manage those wastes. Disposal of DOE waste in commercial facilities would

1 also reduce the limited capacity available for commercial waste disposal. This alternative would offer no
2 clear environmental benefit. LLW would be disposed of on the Central Plateau in unlined trenches, and
3 costs for disposal would be higher.
4

5 **3.2.3.4 Disposal of All Hanford LLW or MLLW at Other Sites**

6

7 DOE previously decided that Hanford LLW and MLLW would be disposed of at Hanford
8 (65 FR 10061). Adequate commercial disposal capacity is not available. In view of the large volumes
9 of waste at Hanford, the cost and number of shipments involved with shipping these wastes offsite, and
10 the limited availability of offsite disposal capacity for certain waste types, DOE does not regard shipping
11 the bulk of Hanford waste to other sites for disposal as a reasonable alternative.
12

13 **3.2.4 Stop Work Scenario**

14

15 In response to stakeholder comments DOE has included a Hanford Only scenario for waste volumes
16 and included a qualitative discussion of a Stop Work scenario for purposes of comparison with the No
17 Action Alternative as described in the previous section. In the Stop Work scenario, all waste management
18 operations including storage, treatment, and disposal would be terminated. No more waste would be
19 processed or treated and no waste would be disposed of. This scenario would not be in conformance to
20 DOE agreements in the TPA, applicable regulations, or previous NEPA decisions. DOE does not
21 consider this to be a reasonable scenario. Specific actions to be taken for each waste type are noted below
22 and then onsite and offsite impacts are briefly identified. A variation of the Stop Work scenario in which
23 Hanford would cease disposing of LLW and MLLW onsite, but would otherwise maintain normal waste
24 management operations, is discussed further in Appendix O.
25

26 Under the Stop Work scenario receipt of LLW would be terminated. Hanford wastes would be stored
27 by the generator, and no offsite wastes would be received. When generators run out of storage space their
28 activities would have to stop also, or other disposal capacity would need to be identified and utilized.
29 No further action would be taken to dispose of waste or to cap the burial grounds. Thus, wastes in the
30 uncapped burial grounds would be exposed to increased water percolation and release to the groundwater.
31

32 Under the Stop Work scenario no further MLLW would be received from onsite or offsite generators.
33 Waste would be left in storage, and no treatment of existing or future-generated wastes would occur. No
34 disposal of additional wastes would take place and there would be no closure of the existing MLLW
35 disposal trenches.
36

37 Under the Stop Work scenario no further TRU waste would be received from onsite or offsite activi-
38 ties. Generators, such as the Plutonium Finishing Plant, would be required to store waste and ultimately
39 cease operations. There would be no retrieval of suspect TRU waste from the burial grounds. There
40 would be no processing or certification of wastes in WRAP or other facilities, and the wastes would be
41 stored. Waste shipments to the WIPP would cease.
42

1 In this scenario for the WTP, DOE would not have the ability to dispose of the ILAW at the Hanford
2 Site. Because of limited storage space for ILAW, tank waste retrieval and operations at the WTP would
3 be jeopardized.

4
5 Waste generators (onsite or offsite) would not be able to dispose of waste at Hanford and would have
6 to make other arrangements. The majority of the wastes would require storage at the generator sites.
7 However, storage at multiple sites would not allow DOE to take advantage of the economies of scale
8 possible by consolidating waste management activities. Lastly, most generators are not permitted to store
9 MLLW longer than 90 days. Most onsite and offsite generators do not have onsite storage available, and
10 the need to increase storage capacity could impact cleanup and closure activities and increase environ-
11 mental impacts at Hanford and other DOE sites.

12 13 **3.3 Volumes of Waste Considered in Each Alternative**

14
15 The environmental impacts of the alternatives considered in this EIS will depend in part on the
16 volumes of each waste type managed at the Hanford Site. In order to assess the impacts of different
17 amounts of waste, alternative waste volume scenarios have been analyzed: Hanford Only, Lower Bound,
18 and Upper Bound.

- 19
20 • The **Hanford Only** waste volume consists of 1) the forecast volumes of LLW, MLLW, and TRU
21 waste from Hanford Site generators, 2) the forecast ILAW and melter volumes from treatment of
22 Hanford tank waste, and 3) existing onsite inventories of waste that are already in storage. The
23 analysis also includes waste that has previously been disposed of.
- 24
25 • The **Lower Bound** waste volume consists of 1) the Hanford Only volume, and 2) additional volumes
26 of LLW and MLLW that are currently forecast for shipment to Hanford from offsite facilities. The
27 Lower Bound volume for TRU waste is not substantially greater than the Hanford Only volume, and
28 is not analyzed separately in all cases.
- 29
30 • The **Upper Bound** waste volume consists of 1) the Lower Bound volume, and 2) estimates of
31 additional LLW, MLLW, and TRU waste volumes that may be received from offsite generators as a
32 result of the WM PEIS decisions.

33
34 A comparison of the waste volumes used for the HSW EIS analyses is shown in Figure 3.3.

35
36 The summary volumes used for each waste type are presented in the following sections. Annual
37 volumes corresponding to the total volumes shown in the tables in this section are listed in Section B.4 of
38 Appendix B (Volume II). These volumes represent the “as-received” volume of waste. As the wastes are
39 treated and prepared for disposal their volumes may change. The changes in volume can be noted in the
40 processing assumptions in Section B.4 of Appendix B (Volume II) and in the flowsheets in Section B.6.
41 A more detailed description of the development of the waste volumes for each type of waste is included in
42 Appendix C (Volume II). The number of significant figures shown in the volume tables can exceed the